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# MORE NOTES ON FUNGOUS INSECTS*

BY HARRY B. WEISS,
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An effort to bring together additional data concerning insects and fleshy fungi has resulted in the following notes. In Entomological News (March, 1923, p. 86) Mr. M. L. J. Higgins records the capture of a large number of the nitidulid beetle *Oxycnemus histrina* in the stink horn fungus *Phallus impudicus* at Mulhall Station, Virginia, on September 23. Champlain and Knull in the Canadian Entomologist (May, 1922, p. 104) state that the curculionid beetle *Otidocephalus myrmex* (Hbst.) feeds on the pustules of the sycamore blight, *Gnomonia veneta*. Writing about the occurrence of the European fly *Muscina pascuorum* Meig., in North America, Johnson (Psyche, Vol. XXX, No. 1, pp. 1-5) states that Schiner (Fauna Austriaca I, 597) says that "Bremi found the larvae in *Agaricus citrinus*."

Recently Mr. Chas. Dury identified for me specimens of the beetle *Plesiocis cribrum* Csy., which were bred from *Polyporus volvatus* collected by Mr. R. D. Hartman on *Pinus coulteri*, October 7, at Mt. Hamilton, California, and *Cis vitula* Mann., bred from *Polyporus versicolor* collected by Mr. Hartman on *Umbellularia californica*, November 8 at Palo Alto, California.

Upon looking into European literature one finds that whereas many species of insects are listed as occurring on fungi the specific names of the hosts are rarely given. In the "Coleoptera of the British Islands" by Fowler, *Cis punctulatus* Gyll. is mentioned as inhabiting *Polyporus abietinus* on Scotch fir and *Cis lineatocribratus* Mell. as being found in *Polyporus nigrinus* on birch. Several references to other European records are noted in former papers on fungous insects.

## LEPIDOPTERA

In Meyrick's "Handbook of British Lepidoptera," the following species whose larvae live mainly on lichens, are listed. Seventeen of the twenty-four species noted belong to the family *Tineidae*. According to Bruce Fink, a lichen "is a fungus usually if not always more or less parasitic during all or part of its life upon an algal host and also sustains a relation to an organic or inorganic substratum."

*Caradrina exulis* Lef. Larva in stems and amongst roots of grass and amongst lichens.

*Cleora lichenaria* Hufn. Larva on lichens.

*Selidosema glabraria* Hb. Larva on lichens.

*Tephronia sepiaria* Hufn. Larva on lichens growing on walls.

*Acanthophila alacella* Dup. Larva on lichens on tree trunks.

*—For previous paper on fungous insects see—Proc. Biol. Soc. Wash. vol. 33, pp. 1-20; vol. 34, pp. 59-62; vol. 34, pp. 85-88; vol 34, pp. 167-172; vol. 35, pp. 125-128; Canadian Ent. Sept., 1922, pp. 198-199; Amer. Nat. vol. LIV, pp. 443-447.

*Symmoca signatella* H. S. Larva has been stated to feed on lichens.
*Acompsia flavifrontella* Hb. Larva on lichens and dead leaves.
*Oinophila v-flavum* Hw. Larva in silken galleries amongst fungus growing on walls in cellars.
*Fumea intermediella* Brd. Larva on grass, lichens etc.
*Fumea betulina* Z. Larva on lichens growing on bushes.
*Fumea sepium* Spr. Larva on lichens growing on trees.
*Solenobia inconspicuella* Stt. Larva on lichens growing on fences and tree trunks.
*Solenobia Douglasii* Stt. Larva on lichens growing on fences, rocks, etc.
*Taleporia pseudobombycella* Hb. Larva on lichens on fences and tree trunks
*Narycia melanella* Hw. Larva on lichens on fences and tree trunks.
*Diplodoma marginepunctella* Stph. Larva on dead insects, fungus, etc.
*Scardia boleti* F. Larva in fungus.
*Tinia corticella* Curt. Larva in fungi growing on trees.
*Tinea parasitella* Hb. Larva in fungi growing on trees.
*Tinea arcuatella* Stt. Larva in fungi growing on trees.
*Tinea confusella* HS. Larva probably on lichens.
*Tinea misella* Z. Larva on dried plant stems, fungi, etc.
*Tinea vinculella* HS. Larva on lichens on rocks.
*Tinea argentimaculella* Stt. Larva in galleries amongst lichens on rocks.

Figure 1. *Polyporus betulinus*. specimen at left showing injury to lower surface and interior by the beetles *Diaperis maculata* and *Thymalus fulgidus*. These beetles breed in the fungus.

Dr. William G. Dietz in his "Revision of the Genera and Species of the Tineid Subfamilies Amydriinae and Tineinae Inhabiting North America" (Trans. Am. Ent. Soc. Vol. XXXI, No. 1) mentions *Tinea oregonella* Busck, *Tinea multistriatella* Dietz and *Tinea rileyi* Dietz as being bred from fungi but does not record the species.

ISOPTERA.

Banks and Snyder in their "Revision of the Nearctic Termites" (U. S. Nat. Mus. Bul. 108) mention that H. G. Hubbard found a colony of *Kalotermes minor* Hagen "on March 1, 1897, at Palm Springs, California. This was a small colony of about 40 to 50 individuals in an old *Polyporus* fungus on a cottonwood or willow tree." They also state that Schwarz found a colony of *Constrictotermes cinereus* Buckley "under a large *Polyporus* lying on the ground at San Diego, Texas.

Wheeler, writing recently in the "Scientific Monthly," (Vol. XVI, No. 3, 1923) under the title "Social Life Among the Insects" states that Petch, who has studied the fungi cultivated by the termites *Odontotermes redmanni* and *obscuriceps* in Ceylon finds that they belong to at least two species, *Volvaria eurhiza* and *Xylaria nigripes*. Petch in his paper "The Fungi of Certain Termite Nests" (Ann. Bot. Gard. Peradeniya 3 (1906) 185-270, f. 3) writes that *Xylaria nigripes* occurs in the same situation in Ceylon, Java, Madagascar and probably Brazil, and that *Xylaria furcata*, which is a form of *nigripes*, occurs in Ceylon and Java, also that *X. nigripes* has been recorded from other countries without any reference to its connection with termite nests. In Ceylon neither *X. nigripes* nor *X. furcata* are found except growing from termite nests. Another species, *Sclerotum stipitatum* (*Sclerotium subterraneum*, Blanco M. Fl. Filip. ed. 2 (1845) 584) is mentioned by Petch as being found in termite nests in India, Ceylon, Java and Africa. Concerning *Collybia albuminosa*, which grows from actual combs in termite nests, Petch states that "the occurrence of agarics in or around termite nests has been recorded from Ceylon, India, Singapore, Java, Borneo and Brazil. The species in question is usually regarded as edible."

William H. Brown in the "Philippine Journal of Science" (C. Botany, Vol. 13, No. 4, pp. 223-231, pls. 3, 4) under the title,, "The Fungi Cultivated by Termites in the Vicinity of Manila and Los Banos" mentions *Collybia albuminosa*, *Xylaria nigripes* and *Xylaria furcata*.

Figure 2. Section through *Fomes applanatus* showing work, larvae and adults of *Bolitotherus cornutus*.

HYMENOPTERA

Wheeler, in his book "Ants, Their Structure, Development and Behaviour," devotes chapter XVIII to the fungous-growing ants. In his article in the "Scientific Monthly" (Vol. XV, No. 6, 1922, p. 536) he has the following to say: "That the fungi cultivated by the various Attiini belong to several different genera is shown by Bruch and Spegazzini, who have recently been able to identify the mushrooms of the fungi cultivated by several Argentinian Attiini. *Acromyrmex lundi*, e.g., cultivates *Xylaria micrura* Speg., *Moellerius heyeri*, *Poroniopsis bruchi* Speg., and *Atta vollenweideri*, a gigantic agaric *Locellina Mazzuchii* Speg." "*Cyphomyrmex rimosus* cultivates a very peculiar fungus (*Tyridiomyces formicarum* Wheeler)." Wheeler states that whereas fungus-growing ants are exclusively American, the fungus-growing termites are all confined to the Ethiopian and Indomalayan regions.

# A NEW SPECIES OF RHEUMATOBATES FROM TEXAS (HETEROPTERA, GERRIDAE)*

BY GRACE OLIVE WILEY,

St. Paul, Minn.

## **Rheumatobates hungerfordi** new species

Velvety-black, covered with a bluish-white bloom except on head, pronotum with a large yellow spot occupying the entire length, in some specimens quadrate, in others twice as wide as long with sides rounded, while in some the spot covers the entire disk of pronotum; mesonotum with a large median yellow spot, almost quadrate, or diamond-shaped in some specimens, while in others it is roughly the shape of an inverted heart. Connexivum of male, yellow for at least half of its apical length; connexivum of female, yellow along outer half for nearly its entire length. These colors vary in the different individuals. In all specimens there is present, just above the base of the acetabula or intermediate coxal cavity, a small yellow spot, varying somewhat in shape from round to quadrate. No ocelli present in either sex.

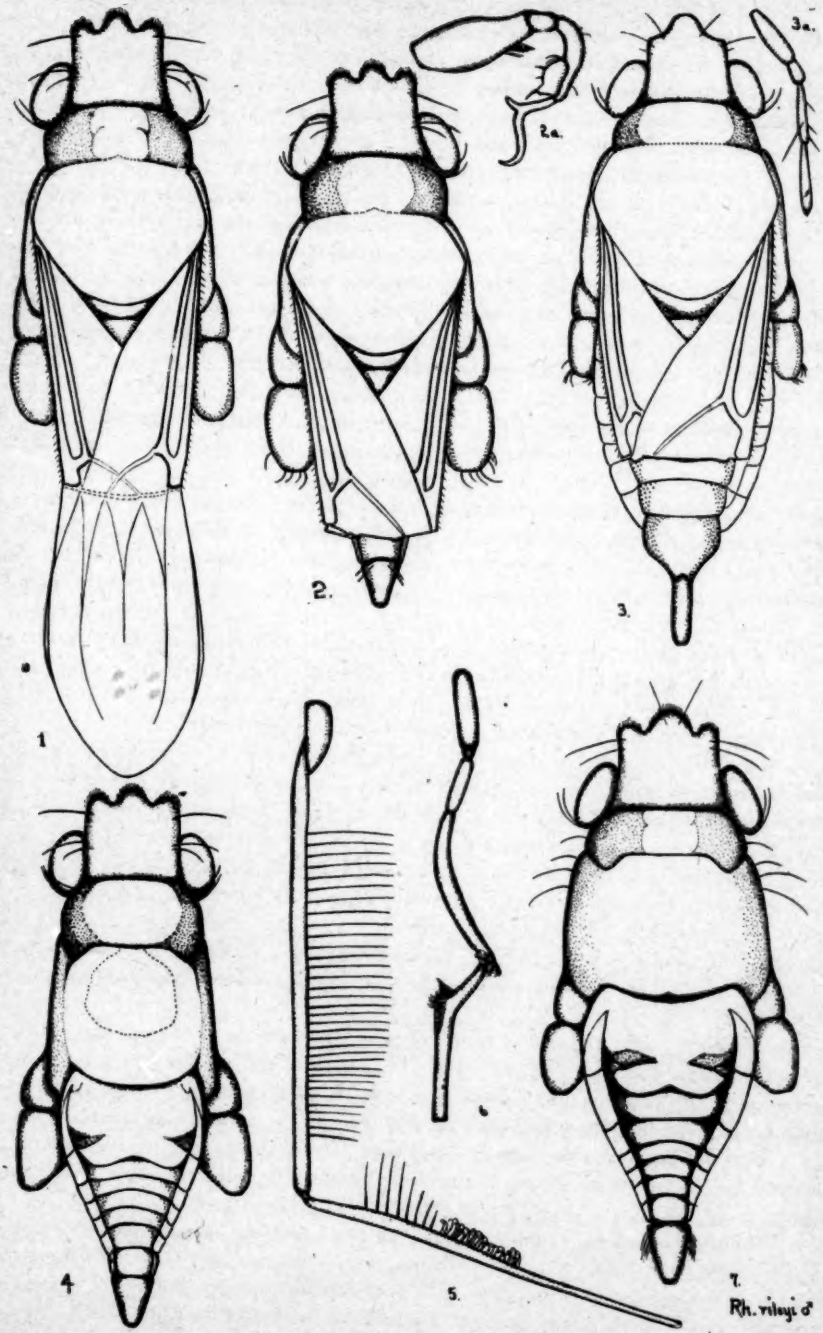
*Apterous male*: Head shorter than *Rh. rileyi* Bergr. and *Rh. tenuipes* Mein., narrower than *Rh. rileyi* and nearly the same width as *Rh. tenuipes.* Width of head across eyes .88 mm.

*Antennae*: Brownish-black, pale at base, segments I, .67 mm. in length, small at base and increasing in size to near the middle, then decreasing to apex, which is about the same as base; adorned on the outer, under side near apex with a brush composed of rather stiff coarse hairs glued together, and just beneath with a scattered bunch of coarse hairs about the same length as brush, and from this there extends almost to base of segment a row of long, fine, semi-erect hairs; these hairs are light in color and are not easily noticed unless seen from a certain angle. Segment II, .15 mm. in length, more slender than segment I at apex and not bearing a spine or tubercle. Segment III, approximate length .60 mm., strongly curved on basal half, large fossa or pit occupying nearly entire length of apical half, and extending a little beyond insertion of segment IV; this pit longer and wider than in *Rh rileyi* Bergr. and *Rh. tenuipes* Mein. Segment IV, .62 mm. in length, curiously bowed, having a stout, thick spur just before the middle which apparently is on the ventral surface, apical half strongly curved (Pl. 10, fig. 2a).

*Thorax*: Pronotum .36 mm. in length, mesonotum .73 mm. in length; pronotum nearly twice as long as that in apterous male of *Rh. rileyi* Bergr., but much narrower; mesonotum not as broad nor as long as in *Rh. rileyi;* abdomen considerably narrower and somewhat shorter than in *rileyi,* also different in form. Sometimes a yellowish spot occupies the apical half of the last abdominal segment and basal portion of the genital segment.

*Legs*: *Anterior legs* much the same in structure as *Rh. riley* Bergr. and *Rh. tenuipes* Mein.; femora pale yellowish, dark at apex, tibiae and tarsi brownish-black. *Intermediate legs*: Coxae much incrassated and larger than the slender posterior coxae; length of femora 2.4 mm., straight, fringed on inner side with long, straight hairs, about thirty in number (varies 28-38) and of nearly

*—Contribution from the Department of Entomology, University of Minnesota.




NEW SPECIES OF RHEUMATOBATES.

equal length throughout (Pl. 10, fig. 5); tibiae 2.07 mm. in length, nearly straight, thicker on basal half, adorned on inner side with four long, straight hairs and three or four shorter ones, followed by many short, upwardly curled hairs which terminate at slightly beyond middle; tarsi 1.78 mm. in length. Color: coxae pale yellowish, apex or apical half dark, trochanters pale, femora brownish-black; tibiae and tarsi also brownish-black. *Posterior legs*: Coxae and trochanters pale yellowish, slender and linear, trochanters dark at apex; length of femur .87 mm., brownish-black in color, strongly arcuate, of nearly equal thickness throughout, but stouter apically than at base, devoid of long hairs except at apex where a few are curled around the tip; tibiae .96 mm. in length, brownish-black, joint nearly at right angles to the outer side of femur, on basal half much incrassated and angulately-elbowed, adorned with a stiff brush of rather long, coarse hairs, apical half of tibiae straight and of nearly equal thickness; tarsi 1.42 mm. in length and brownish-black in color.

*Apterous female*: Longer and more robust than male, except head, which is smaller and narrower across the eyes. Antennae slender, resembling the female antennae of *Rh. rileyi* Bergr. and *Rh. tenuipes* Mein. Pronotum .24 mm. in length, shorter and slightly narrower than in the male, and nearly one-third longer than pronotum of apterous female *Rh. rileyi* Bergr.; length of mesonotum .70 mm., being shorter and wider than male; length of abdomen 1.71 mm., longer and wider than male, and shorter than apterous female *Rh. rileyi* Bergr.; mesosternum brownish-yellow, variable, sometimes with anterior margin and two posteriorly diverging bands, dark brown, in this respect similar to female of *Rh. tenuipes* Mein.; first genital segment usually with median oblong yellow spot occupying apical three-fourths of the segment. Legs much the same as females of *Rh. rileyi* Bergr. and *Rh. tenuipes* Mein. Sometimes there is a small yellow spot on the last abdominal segment near its apical margin.

*Macropterous male*: Head, eyes and antennae similar to apterous male; pronotum with yellow spot, mesonotum velvety-black and without yellow spot; pronotum not separated from mesonotum by a visible suture.

*Hemelytra*: Bluish-white, the veins prominent and very dark brown in color; membrane smoky-brown, extending from impressed line to far beyond tip of abdomen, this indentation or groove crossing the hemelytra from edge to edge, being outwardly curved along middle.

*Macropterous female*: Head, eyes and antennae similar to that of apterous female; mesonotum without yellow spot. Hemelytra same as macropterous male.

*Nymphs*: The nymphs have the same color markings as the adults. Differences between the sexes can be told by a glance at the genital segments, and the males of at least the third instar on, can be distinguished by the peculiar swellings of the posterior tibiae and the first and third antennal segments.

This species has the habit of breaking off the long wing membrane as recorded by *Torre-Bueno* (Ohio Naturalist, Vol. VIII, 1908) in other Halobatinae.

These insects were taken in quiet eddies of swiftly flowing streams, and in still pools and ponds, and were always found in company with *Trepobates pictus*. The winged forms are very agile and hard to capture; they have a habit when disturbed of skimming over the surface of the water in astonishing leaps

and bounds, no doubt aided by their wings even when truncated. The bluish-white hemelytra of the winged individuals and the bloom and yellow markings on pronotum and mesonotum of the apterous ones, make them very conspicuous for such small bugs. No doubt all specimens are covered with bloom, but in the specimens examined it does not occur on the head, nor on the mesonotum of the macropterous forms.

*Holotype*: apterous male, collected near Rock Island, Texas, Aug. 2, 1922 (Grace O. Wiley); in author's collection.

*Allotype*: taken at type locality, June 27, 1922 (Grace O. Wiley).

*Morphotypes*: (macropterous form) male collected June 6, 1922, at type locality; female collected May 23, 1922, at type locality (Grace O. Wiley).

*Paratypes*: 6 specimens taken with the type; numerous specimens taken from April to Sept. 15, 1922, near Rock Island and June 14—16, Galveston, Texas, a few specimens taken near Cisco, Texas, June, 1921, collected by the writer.

Paratypes deposited in the collections of the University of Minnesota, the University of Kansas, and in the collections of Mr. William E. Hoffman and the writer.

I propose the name *hungerfordi* for this species, in honor of Dr. H. B. Hungerford, because of his great interest in water-bugs which was an incentive to the writer in the study of this remarkable group.

EXPLANATION OF PLATE.

1. *Rh. hungerfordi* n. sp., Macropterous male.
2. *Rh. hungerfordi* n. sp., truncate-winged male.
2a. Male antennae *Rh. hungerfordi*, (segments III-IV twisted to show fossa).
3. *Rh. hungerfordi* n. sp., macropterous female with truncate wings.
3a. Antennae of female *Rh. hungerfordi* n. sp.
4. *Rh. hungerfordi* n. sp., apterous male, drawn from type.
5. Intermediate leg of ♂ *Rh. hungerfordi* n. sp.
6. Posterior leg of ♂ *Rh. hungerfordi* n. sp.
7. *Rh. rileyi* Bergr., apterous male.

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## SOME COLORADO BEES

BY T. D. A. COCKERELL,

Boulder, Colo.

### **Xenoglossa pruinosa** Say, var. **lutzi** n. var.

Female with end of abdomen more or less reddened, and the pubescence on fifth and sixth segments (except the light hair at extreme sides) very brilliant ferruginous-red. Male ordinary, except that one specimen out of 25 has no yellow spot on clypeus.

Grand Junction, Colorado, 2 ♀, 25 ♂; August 3, 1920 (Lutz 4758 and 4758 B); Alt. prox. 4,500 ft.

### **Osmia holochlora** sp. n.

*Male.* Length about 8.5 mm., similar to *O. bennettae* Ckll., to which it

runs in my ms. table, but certainly distinct, differing thus: entirely very bright yellowish-green, with purple tints; hair of head and thorax pure white, shining; face, tegulae and anterior part of thorax with strong golden tints; mesothorax more coarsely rugosopunctate; hair of mesopleura shorter; wings not distinctly brownish; tarsi with last joint dark red; sixth abdominal segment deeply emarginate (seventh similarly emarginate. Other characters are antennae black; mandibles with a green spot; tegulae golden-green; apical part of abdomen with black hair above. Easily known from *O. bella* Cress. by the entirely pure white hair of head and thorax above.

Minnehaha, Pike's Preek, Colorado, at flowers of *Pentstemon gracilis*, June 13, 1918. (Frances Long.) U. S. National Museum.

I take this opportunity to note that *Osmia nassa* Ckll., described from California, extends to Utah. The U. S. National Museum has a ♀ from Salt Lake City, June 13, 1899.

*Osmia pusilla* Cresson was based on the male, from Pike's Peak, Colo. In June, 1918, Miss Frances Long collected six of these males at flowers of *Mertensia pratensis*, at Minnehaha, Pike's Peak. In the same month, at the same flowers, she got one *O. pentstemonis* Ckll., one *O. albolateralis* Ckll., two *O. melanotricha* Lovell & Ckll., and two *O. hypoleuca* Ckll., all females. I think it is practically certain that *O. melanotricha* is the female of *O. pusilla*. In the same locality and month, but at flowers of *Pentstemon gracilis*, Miss Long obtained 3 ♀, 1 ♂, of *O. pentstemonis* Ckll., and one ♀ of *O. rohweri* Ckll. The male of *pentstemonis* is new; it looks much like the female; length about 7 mm.; head and thorax dark green, abdomen dark blue; sides of face with long white hair; antennae long and slender, dark; tegulae steel-blue anteriorly, posteriorly dark reddish; tarsi slender, hind basitarsi with an angulation beneath beyond the middle; sixth segment of abdomen only very feebly submarginate in middle, seventh strongly bidentate; stipites apically rounded, simple, shaped like the last joint of a finger. *O. rohweri* was described as a variety of *O. hypochrysea* Ckll., but it always has the first recurrent nervure about twice as far from base of second submarginal cell as second from apex; whereas in *hypochrysea* the recurrents are about equally far from base and apex.

## **Colletes nigrifrons** Titus.

Early last summer Dr. Lutz and Mrs. Cockerell noticed at Boulder that *Mertensia* flowers frequently had a large hole in the tube, evidently cut by some bee to get at the nectar. In spite of a good deal of effort the culprit remained unknown until in July we were camped in the Roan Mountains, at the head of the Ute trail. There I was so fortunate as to catch the bees in the act, and they were *Colletes nigrifrons*. This is a short-tongued bee, which could not get at the nectar in a legitimate manner.

## **Andrena micranthophila** Ckll.

A new locality is Ute Creek, Colo. (Sage Flats), July (L. Bruner).

There are at present (Jan. 15) 612 species of bees known from Colorado, and in addition a considerable number of varieties and races.

# APPARENTLY UNDESCRIBED CANADIAN ASILIDAE AND DOLICHOPODIDAE, (DIPTERA).*

BY C. HOWARD CURRAN,
Ottawa, Ont.

## Holopogon albipilosus n. sp.

Differs from *seniculus* Loew in having decidedly shorter pile throughout.

Length 6.5 to 7 mm. *Female.* Face and front silvery white; wholly white pilose. Occiput shining black; pale pollinose below; pile white. Antennae black, first joint rather slender, longer than the second, which is nearly as broad as long; third equal to the first two combined, as wide as the first, gradually slightly narrowed to the apex, style moderately slender, half as long as third joint. Hair on antennae whitish.

Thorax shining black; a large square spot in front, the sides of the mesonotum and the pleura, white pollinose. No brownish pollen. Pile white, on dorsum erect, straight, moderately abundant, fine; on the pleura woolly. Scutellum shining black, with rather long, slightly woolly pile.

Legs shining black; all the femora rather stout; hind tibiae greatly enlarged; hind tarsi gradually tapering. Pile and bristles of legs wholly whitish. Pubescence on front and hind tibiae and tarsal pads dull yellowish.

Wings pure hyaline. Halteres yellow, the basal half brown.

Abdomen shining black, with pale yellowish or white pile which is longer on the sides, especially basally.

*Male.* Face and front black pilose; antennae black haired.

Thorax with yellow pollen on mesonotum instead of white, and with some black hairs on disc.

Pile on disc of abdomen black, on sides beyond the third segment yellow.

*Holotype*—♂, Vernon, B. C., August 5, 1920, (N. L. Cutler), No. 569, in the Canadian National Collection, Ottawa.

*Allotype*—♀, same data.

*Paratypes*—2 ♀, Vernon, B. C., July 16 and 21, 1920, (N. L. Cutler); ♀, Chilcotin, B. C., July 17, 1920, (E. R. Buckell).

I had determined this species as *seniculus,* but comparison with the type proves it to be distinct and it is readily recognized by the much shorter pile throughout, especially that on the thorax.

## Holopogon tibialis n. sp.

Distinguished from all other species by lacking yellowish pubescence on hind tibiae.

Length 8 mm. *Male.* Face and front shining black, the colour of the former obscured when viewed from above, by whitish yellow pollen; front thinly brownish yellow pollinose, hardly shining. Occiput shining black. Head black pilose except on the occiput below. Antennae black; first joint one and one-half times as long as second, second twice as long as wide; third as long as first two, slightly coarctate sub-basally; style half as long as third joint, very slender.

Thorax shining black, thinly tawny pollinose, with a broad, more blackish

*—Contribution from the Division of Systematic Entomology, Entomological Branch, Dept., of Agric., Ottawa.

stripe on either side of the middle line. Pile black, yellow on pleura; white on humeri and propleura. Scutellum black, with long black pile.

Legs shining black; black haired; basal half of femora and front four tibiae white haired; all the bristles black. Pubescence on front tibiae and tarsi, yellow, on the hind ones, brown. Hind tibiae greatly enlarged.

Wings tinged with brown. Halteres yellow, their base brown. Abdomen shining blue black, with a violet cast; black pilose, except on sides of first three segments.

*Holotype*— ♂, Jordan, Ont., June 28, 1919, (Curran), No. 570, in the Canadian National Collection, Ottawa.

*Paratype*— ♂, June 29, 1919, same data.

### **Nicocles canadensis** n. sp.

Differs from other species by having only the last abdominal segment in the male silvery.

Length, 9 to 14 mm. *Male*. Head black in ground color, but almost concealed beneath dense white pollen, the occiput with some yellowish brown pollen above. Face gently concave; almost flat; with some scattered, fine white hairs, mystax rather fine, long, white, no bristles. Front bare except a few hairs opposite the ocellar tubercle and some longer ones on it, the bristly hairs yellowish. Occiput with white hairs, the bristles which are short and moderately stout, yellowish. Antennae black, with a slight whitish sheen in some lights, the first two joints with yellow hairs; first joint longer than second; third joint one and one third times as long as the first two combined, its upper surface almost straight, its lower very slightly convex; arista equal to the first two joints, moderately slender.

Thorax shining black in ground colour, the broad sides of the mesonotum and pleura greyish white pollinose; and there is a similar coloured median stripe on the anterior half of the former. On either side of the median line the colour is deep black, and becomes tawny brownish before the lateral white margin, the brown expanding posteriorly to form a broad band before the scutellum, so that the black is well separated from the posterior margin. The scattered hairs on the dorsum are whitish, the bristles reddish; propleura with fine, the epipleura with stout white hairs. Scutellum with the ground color concealed by white pollen, the apex and a narrow transverse median line with a yellow tinge in some lights; with a few long, scattered white hairs, and four reddish bristles.

Coxae black, densely greyish white pollinose, with fine white hairs. Front femora black, their apices, broadly below, and a small ventral basal spot, reddish; hind femora reddish with a broad black stripe in front. Tibiae reddish, the hind ones darkened on the basal half externally. Tarsi black, the joints narrowly reddish basally; the basitarsi and hind tarsal joints broadly reddish basally. Hair on legs not abundant, short, whitish; on the posterior and ventral surfaces of the front four tibiae, long, white; middle tibiae with row of white bristles on antero-outer surface; hind ones with a row of short, widely set white bristles on front and hind outer surfaces. Each tarsal joint with two apical, fine yellow bristles. Hind femora a little thickened and curved down-

ward apically; hind tibiae swollen on apical fifth, their tarsi largest at end of first joint, thence gradually narrowing.

Wings hyaline, with clouds on all the crossveins and furcations, a long dash behind the stigma and the apex of the wing broadly brownish. Halteres fuscous.

Abdomen steel blue, the sides of each segment with a sericeous stripe, wider in front, narrow behind, rising almost or quite at the base of the segment and reaching its apex. Second segment with a brown pollinose spot in front, the sides of the first segment with more or less brown pollen. The last segment is red, with a broad, black, more or less triangular basal black spot and triangles on the lateral margin reaching quite to the apex, black; the whole segment silvery from front view. Pile of abdomen, short, appressed, yellowish; white and erect on sides. Venter tawny with black spots, a pair of basal spots and the sides of each ventral segment grey.

*Female.* Third antennal joint slightly longer, with almost parallel sides.

Wings with the markings darker, and with the veins bordered with brown at the apex of the wing, instead of with a continuous cloud.

Abdomen with the grey pollen produced inwardly as a triangle on each segment, on the fifth and sixth segments forming large triangles, on the seventh a smaller triangle. The venter is scarcely tawny, being more greyish, the spots larger.

*Holotype*— ♂, Saanich, B. C., April 19, 1914, (W. Downes), No. 568, in the Canadian National Collection.

*Allotype*— ♀, Seattle, Washington, June 4.

*Paratypes*— ♂, Royal Oak, B. C., May 26, 1917, (R. C. Treherne); ♂, Mt. Douglas, B. C., April 19, 1918, (W. Downes); ♂ Seattle, Washington, April 12.

A second female has hind legs black, with only traces of red on femora and tibiae. It may be distinct.

### Syntormon tricoloripes n. sp.

Femora green, becoming blackish, their apices, except the hind ones, reddish; tibiae and front four basitarsi reddish; tarsi black. Front moderately shining purple.

Length 5 mm. *Male.* Face whitish, a little more silvery coloured above, narrowest in the middle. Palpi brown, their apices with pale yellow pollen; with fine white hair. Front metallic purple, depressed, the narrow sides green. Antennae black, with black hair; third joint with tawny pubescence; first joint sub-triangular, the inner apex sharp; second slightly longer than the first, its projection long and narrow; third joint large, subtriangular, the lower border flattened as far as the tip of the second joint, its apex acute; arista not quite terminal, rather slender, tapering, the basal section about four times as long as wide, bare. Occiput metallic green with a triangular bronze spot below the vertex, wholly thinly white pollinose. Orbital ciliæ black; hair on lower half whitish, rather fine. Lower orbitals wanting.

Thorax metallic green; mesonotum with a narrow cupreous brown median stripe, a broad, irregular cupreous stripe on either side; more or less irregularly

cupreous laterally and the mesopleura wholly so. Thoracic bristles black; short bristly hairs limited to the median line and an angle in front; there is a double row of tiny bristles on either side of the middle line which reaches to the first large bristle, then extends across to the side behind the humeri. Epipleura and propleura with white pile.

Coxae green, yellowish at apices, thinly whitish pollinose, clothed with fine white pile; one large black bristle on outer surface of hind coxae. Femora metallic green, the apices of the front four broadly, of the hind ones narrowly, reddish yellow, the colour blackish just before the yellow ground; tibiae reddish tarsi black, the front four basitarsi reddish except their apices; pile wholly black. Middle femora with a row of black bristles on a little more than the median half below, middle and hind femora each with one preapical bristle. Hind tibiae gradually thickened on apical half.

Wings tinged with brownish, especially marked anteriorly. A darker spot on the crossvein and at the curve of the fourth vein. Costa a little thickened beyond the first vein. Squamae with a slight yellow tinge, with a brown border, the fringe yellowish white. Halteres yellowish white.

Abdomen metallic green, thinly covered with greyish pollen, the base of the segments cupreous, more broadly so in the middle, this color occupying about half the segment on the apical three. Hairs black, with some shorter, finer whitish intermixed, these hairs more abundant and longer laterally. Genitalia small, black.

*Female*: Face wide, yellowish pollinose; middle and hind femora reddish, the latter with a black spot before the preapical bristle; posterior basitarsi reddish on basal third.

*Holotype*— ♂, Cranbrook, B. C., May 12, 1922, (C. B. D. Garrett), No. 566, in the Canadian National Collection.

*Allotype*— ♀, same data, May 18th.

*Paratypes*— ♂, same locality, May 12, ♀ May 5, (Garrett).

Readily distinguished from *affinis* Wheeler, by the dark legs.

## Porphyrops grandis n. sp.

Large, 7.5 mm.; thorax bright green or blue green; middle and hind coxae with terminal matted tuft of black hairs; ciliae of squamae and halteres yellow; legs chiefly yellowish.

Length 7.5 mm. *Male*. Face very narrow; narrowest about the lower two-thirds; shining yellowish white; brown just below each antenna. Front bright green, the sides and ocellar tubercle deep blue or blackish; bare except for the black bristles. Occiput green; superior bristles black; hairs on lower half white, abundant. Antennae black; third joint enlongate oval-triangular, its apex sharply rounded; arista terminal, its first joint twice as long as wide, rather stout. Eyes brown pilose, the posterior orbits with pale pile. Palpi black, yellow pollinose anteriorly, black haired.

Thorax brassy green, sometimes bluish on the disk, with a wide geminate, slightly darker median line, scarcely pollinose; pleura thinly greyish white pollinose. Bristles black; propleura with rather abundant milky white hair. Scutellum concolorous with disk of thorax, with three of four bristles laterally, the inner one much the strongest.

Legs: coxae blackish, rather thickly greyish pollinose; all rather abundantly milky white pilose; the front four with a long, black, stout hair on the outer surface sub-apically, the middle ones with a long apical pencil of black hairs, the hind ones with a much shorter apical pencil, no external bristle. Front femora metallic green, the narrow base and broader apex, reddish yellow; middle and hind femora reddish yellow, the former with a metallic green stripe on the inferior basal half, the latter with a ventral black stripe. Femora black haired, the front four white haired beneath, the middle ones with long hair beneath; front femora with rather long, moderately abundant black hair on posterior surface, stouter apically; the middle and hind each with five to eight strong black bristles behind and three or four in front, apically. Hind femora black above at apex. Tibiae yellowish, the hind ones black on inner surface, their apex darkened, all with two rows of black bristles outwardly, the middle ones with two bristles on apical fourth beneath, one anterior, one posterior. Tarsi black, the front four basitarsi wholly pale, the front one swollen at apex, the second joint rising at its top.

Wings hyaline, yellowish anteriorly and along the veins; anal cell rounded apically. Third vein curved backward apically, the fourth vein curved forward beyond the middle of its last section, then curved back apically to end in the tip of the wing. Costa simple. Allulae small with long fringe of white hairs. Squamae pallidly yellowish, with long yellowish white ciliae. Halteres yellow, their basal half pale brownish, finely whitish pubescent.

Abdomen metallic green, with brassy reflections; first segment and narrow bases of the remainder, broadened medianly, blackish, rather dull, bordered with bronze. Hairs sparse, black; first three segments with long pale yellow hairs laterally. Sixth segment bright blue. (What I have termed the first segment in describing the color is not usually counted and I have not counted it otherwise.) Genitalia black, the bulb more or less greenish. Lamellae moderately broad sub-basally, as long as last two abdominal segments, dirty yellowish, its apical fourth brown, hair black. Claspers black, shining, flattened, with subparallel sides, the end a little curved downwards so as to appear clubbed from lateral view; from same view they are very thin. Sides of abdomen thinly white pollinose.

*Holotype*— ♂, Agassiz, B. C., July 24, 1922, (R. Glendenning), No. 579, in the Canadian National Collection.

*Paratype*— ♂, same locality and collector, May 11, 1922.

## NOTES ON ABERRATIONAL NAMES OMITTED FROM THE BARNES AND McDUNNOUGH CHECK LIST (LEPID.)

BY WM. BARNES and F. H. BENJAMIN,
Decatur, Ill.

In Can. Ent., LIV, 100, Dr. McDunnough called attention to names which Dr. Strand applied to aberrations of Catocala listed by Sir George Hampson in Cat. Lep. Phal. B. M.

Letters to Dr. Strand disclosed the fact that practically all of the unnamed "aberrations" of Hampson's Catalogue have received names. This means that a large number of names have been omitted from the Check List and complicates the syonymy of the Phalaenidae (Noctuidae). In a number of cases these names will be found applicable to species and forms named by Dr. Smith and other

workers in publications usually having priority. A few have been named subsequently. Others, due to misidentifications by Hampson, will refer to older names the types of which were unknown at the British Museum at the time of the publication of the various volumes of the Cat. Lep. Phal. Still others apply to forms or aberrations placed in the synonymy because various revisional workers and cataloguers have not considered them distinct enough to be worthy of separate names. In groups where species closely resemble one another, such as *Polia, Eriopyga, Autographa, Catocala,* etc., the actual application of many of Dr. Strand's names will be doubtful until the specimens from which Hampson drew his diagnoses of "ab. 1," "ab. 2," etc. can be studied; and the naming of further species or forms in the more difficult groups entails a considerable risk of creating synonyms. It is still an open question if a name can be elevated to specific rank which was originally described as an aberration; but pending advice from Dr. Stiles, Secretary of the International Commission of Zoological Nomenclature, the authors follow the usual custom of considering a name available regardless of the status given it by its author.

Inquiries have already gone forward to the authorities of the British Museum in regard to the fixation of a definite specimen as the "type" of each of Hampson's "aberrations," the same specimen becoming the type of the Strand name. It is hoped that with the assistance of Mr. Tams most of Dr. Strand's names can be fitted to actual types and thus placed.

An example of a considerable number of names omitted from the Check List is to be found in the genus *Autographa*. Because of an ever increasing number of new species and forms being named in this genus it will, perhaps, be well to re-publish the names applied by Dr. Strand which deal with the fauna of Boreal America. These names were published in the Archiv fur Naturgeschichte, 1916, A, 2, pp. 47-50.

*Autographa microgamma* ab. *v-notata* Strand.

It is likely that true *microgamma* does not occur in North America, in which case ab. *v-notata* need not be added to the lists. Should the European species be found distinct from its American representative, the name *montana* Packard (1874, Guide to the Study of Insects, p. 313, *Plusia*), also omitted from all lists, will probably be found to apply to the North American form.

*Autographa lula* Strand.

1913, Hamp., Cat. Lep. Phal. B. M., XIII, 419, *snovi* ab. 1, *Syngrapha.*
1916, Strand, Archiv. für Naturgesch., A. 2. 47, *snowi* ab., *Syngrapha.*
1913, Hamp., Cat. Lep. Phal. B. M. XIII, 418, pl. CCXXXVI, f. 8, (as "snovi"), *Syngrapha.*
1919, Ottol., Jour N. Y. Ent. Soc., XXVII, 121, pl. XV, f. 2, *Autographa.*
1921, McD., Can. Ent., LIII, 85. *diasema* race, *Syngrapha.*
1922, McD., Can. Ent., LIV, 139, an sp. dist., *Autographa.*

The name *lula* Strand apparently has priority for the species. It is based on ab. 1 of *snovi* Hampson (nec. *snowi* Hy. Edw.).

Apparently the normal form is the one figured by Mr. Ottolengui as the type of *diversigna,* and has at least some trace of a spot or dash disconnected with the U-shaped stigma.

*Autographa epigaea* ab. *epigaeela* Strand (ab. 1 of Hampson).

*Autographa rectangula* ab. *demaculata* Strand (ab. 2 of Hampson).

*Autographa octoscripta* ab. *beta* Strand (ab. 3 of Hampson).

*Autographa excelsana* Strand.

1913, Hamp., Cat. Lep. Phal. B. M., XIII, 427, *excelsa* ab. 1, *Syngrapha.*
1916, Strand, Archiv für Naturgesch., A, 2, 47, *excelsa* ab., *Syngrapha.*
form normal *alta* Ottolengui.
1919, Ottol., Jour. N. Y. Ent. Soc., XXVII, 125, *Autographa.*
homonym *excelsa* Ottolengui.
1902, Ottol., Jour N. Y. Ent. Soc., X, 71, pl. VI, f. 3, *Autographa.*

Mr. Ottolegui sunk his name *excelsa* because of *excelsa* Kretchmar, proposing *alta* in its place, (1919). Unless Hampson's identification of "*excelsa* ab. 1" was erroneous, Strand's name *excelsana* apparently attains specific priority.

*Autographa altera* ab. *alterana* Strand (ab. 1 of Hampson).

*Autographa egena* ab. *egenoides* Strand (ab. 1 of Hampson).

*Autographa brassicae Riley.*

1870, Riley, Second Rept. Ins. Mo., p 110, f. 81, biol., *Plusia.*
synonym *u-notata* Strand.
1913, Hamp. Cat. Lep. Phal. B. M., XIII, 468, *brassicae* ab. 1, *Phytometra.*
form *echinocystidis* Strecker.
1874, Stkr., Rhop. & Het., p. 94, *Plusia.*

The name *u-notata* applies to the form of *brassicae* with the U-shaped stigma and spot disconnected. According to Dr. Riley's figure of his type, and a specimen compared with the type in the National Museum, this form is the one to which the name *brassicae* must apply. If it is desired to split upon the character of the stigma the name *echinocystidis* may be used for the form with the stigma and spot connected. Apparently the first description of this form is in Strecker, Lep. Rhop. & Het., p. 94, and although Strecker credited the name to "Behr Mss.," the description was obviously written and published by Strecker so that the authorship will have to be credited to him. The name was originally written *echinocystidis*; and in 1900 Strecker wrote it *echinocystides* (Lep Rhop. & Het., Suppl. 3, p. 33). It is usually written *echinocystis* but in the absence of proof of a *lapsus calami* the original orthography should be preserved.

*Autographa putnami* ab. *punctistigma* Strand (ab. 1 of Hampson).

*Autographa putnami* ab. *mendocinensis* Strand (ab. 2 of Hampson).

Possibly represents a distinct species or race.

*Autographa biloba* ab. *venezuelensis* Strand (ab. 1 of Hampson).

Probably represents a distinct species or race not found in Boreal America.

*Autographa oo* ab. *oonana* Strand (ab. 1 of Hampson).

*Autographa precationis* ab. *tana* Strand (ab. 1 of Hampson).

*Autographa bimaculata* ab. *adapa* Strand (ab. 1 of Hampson).

*Autographa pseudogamma* ab. *freya* Strand (ab. 1 of Hampson).

*Autographa ou* ab. *ouana* Strand (ab. 1 of Hampson).

*Autographa ou* ab. *ouella* Strand (ab. 2 of Hampson).

This name is presumably a straight synonym of *pedalis* Grote, judging from a specimen of ab. *pedalis* compared with type by Dr. McDunnough.

*Autographa metallica* ab. *kasloensis* Strand. (ab. 1 of Hampson).

Judging from a series in the Barnes Collection the differences between *metallica* and *kasloensis* are mainly due to the age of the specimens. Fresh specimens have the maculation considerably brighter and in general more intensified than old specimens.

## NOTES ON LYGAEUS KALMII STAL. AND ALLIES (HEMIP.)[1]

BY E. P. VAN DUZEE,
San Francisco, Calif.

In the April, 1923, number of the Canadian Entomologist Dr. Parshley gives some interesting notes on *Lygaeus kalmii* Stal. It seems to me that he has misidentified this and some allied species, probably through following Stal in the Enumeratio Hemipterorum.

*Lygaeus turcicus* Fabr. is a Mexican form which spreads well over our southern states and may be distinguished by the Y-shaped red mark on the head, the red base of the clavus and the almost immaculate membrane.

*Lygaeus costalis* H. S., with a still more southerly distribution, has the red on the head reduced to a basal spot, the red more extended on the clavus and the membrane white-margined.

*Lygaeus reclivatus* Say has the red basal spot on the head as in *costalis* but the clavus is black and the membrane heavily marked with white. This is the *kalmii* of Dr. Parshley's paper and, as he says, is western in distribution. It is abundant in California and is the only species of this series I have taken here. It includes varieties *a* and *b* of Stal's *Kalmii*.

*Lygaeus kalmii* Stal differs from *reclivatus* in having the white membranal margin very narrow and the discal spot wanting or very small. This is variety *c* of Stal's *kalmii* and it is *angustomarginatus* Parshley. It might be better to sink Stal's name *kalmii* as a straight synonym of *reclivatus* and use *angustomarginatus* for the eastern form, but Stal's description of *kalmii* covers both forms and the name has been used for our eastern species for so many years I would personally favor retaining it, an entirely permissible procedure, as Stal does not indicate which of his three varieties he considers typical. The variety *enotus* Say should perhaps replace *kalmii*, but Say says "Mexico" and I doubt if the eastern form extends so far south. Montandon's melanic *melanodermus* is unknown to me.

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## SOME NEW NOCTUIDS FROM BRITISH COLUMBIA (LEPID.)

BY E. H. BLACKMORE,
Victoria, B. C.

AGROTINAE

### **Euxoa lindseyi** nov sp.

Palpi white exteriorly with a cluster of black and fuscous scales near the distal end of the second joint. Head and thorax pale ash grey with a few black scales at the tips of the patagia. Abdomen concolorous with thorax, with tufts of long white hair at base.

♂. Primaries cinereous grey sparsely scattered over with fuscous scales Basal line dark fuscous, indicated on costa, re-appearing on median vein from which it runs inwardly oblique to vein 2; t.a. line dark fuscous, indeterminate, indicated by spot on costa, a short outwardly oblique dash on radius, another similar on median vein faintly continued in an outwardly oblique direction to vein 2, where it forms a distinct tooth from that vein to inner margin. Reniform and orbicular dark fuscous, illy defined, the former roughly lunate, the latter more or less round. Above the reniform is a dark costal spot. T.p. line puncti-

1—Contributions from the California Academy of Sciences, No. 224.

form, outwardly rounded opposite cell, then slightly inwardly oblique to inner margin. Terminal line dark fuscous broken into intervenular triangular dots. Fringe light fuscous, paler basally.

Secondaries sordid white, terminal line fuscous, with veins outlined in same colour, a few scattered fuscous scales on outer margin. Beneath, primaries pale cinereous with cell darker, t.p. line and reniform showing through dark and distinct; secondaries lighter with small fuscous discal dot, post median band faintly indicated, more prominent on costal portion.

♀. Upper side of primaries somewhat darker caused by the greater number of fuscous scales scattered over the surface, the lines and spots are also a little heavier. Secondaries light fuscous, paler basally. Beneath similar to male.

Alar expanse ♂ 33 mm., ♀ 37 mm.

Described from 7 specimens, 3 males and 2 females taken by the author on Vancouver Island and a male and female from the Barnes collection taken at Calgary, Alta., and Victoria, B.C., respectively.

*Holotype*—♂, Goldstream, B. C., Aug. 20th, 1920, in Canadian National Collection, Ottawa.

*Allotype*—♀, Victoria, B. C., Aug. 18th, 1921, in author's collection.

*Paratypes*—2 ♂♂, Goldstream, B. C., Sept. 11th & 12th, 1920 and 1 ♀ (without abdomen) Victoria, B. C., Aug. 19th, 1916, in author's collection; 1 ♂, labelled Ft. Calgary, N. W. Brit. Col. (Calgary, Alta.) Aug. 20th, 1909, and 1 ♀, (without abdomen) Victoria, B. C., without date, in collection of Dr. W. Barnes.

Superficially this new species is very much like *catenula* Grt., to which it closely allied.

I take pleasure in naming this species after Dr. A. W. Lindsey, to whom I am very much indebted for kindly help on many occasions.

CUCULLIINAE

**Onococnemis parvanigra** nov. sp.

Palpi deep cream, second joint with a few scattered black scales exteriorly. The second and third joints are clothed posteriorly with long black and white hairs, the black predominating. Head and thorax mouse gray with a somewhat hoary appearance, caused by the gray scales being tipped with white. Abdomen light fuscous, thinly scaled. Primaries, the general effect is brownish black with a somewhat lighter basal area and an irregular diffuse cream colored post-median band. Basal line black, outwardly oblique to sub-costal vein, where it disappears and is indicated again below median vein by two or three black scales. T.a. line brownish black, irregularly sinuous, inwardly oblique from vein 4 to vein 2 and thence outwardly oblique to inner margin. A small patch of ochreous scales precedes the t.a. line between costa and sub-costal vein. Orbicular round, black-ringed, and containing a few light brown and ochreous scales. Reniform sub-lunate, filled mostly with deep cream with some dark brown scales intermixed. Claviform distinct, outlined in black and filled with light brown. Median band brownish black, lighter costally. T. p. line brownish black, beginning a little over one-half out, straight from costa to sub-costal vein, then broadly outcurved to include reniform, then gently incurved to vein 2, from which it runs

obliquely inward to inner margin. This line is edged posteriorly with deep cream scales, which on the lower half of the wing are extended into the s.t. space. Beyond this, on costa, are two small patches of cream scales equidistant between reniform and s. t. line. The s. t. line is faintly indicated by cream scales, which appear at irregular intervals, becoming continuous at vein 4, where it curves to the outer angle of wing. Terminal space brownish black. Fringes concolorous. Secondaries, a broad brownish black band occupies the outer third of the wing; the basal area is dark fuscous and is separated from the broad marginal border by a narrow, somewhat diffuse, cream colored band. Discal dot large, linear, brownish black. Fringes white. Beneath, primaries basal half fuscous, followed by a whitish band from costa to inner margin, which in turn is bordered by a wide brownish black band on outer margin. Secondaries similar to primaries with the addition of a very distinct discal dot.

Alar expanse 25-26 mm.

Described from 4 specimens, one male and three females taken at Kaslo, B. C., and Mt. McLean, near Lillooet, B. C.

*Holotype*—♂, Kaslo, B. C., (J. W. Cockle) August 10th, 1922, in the Canadian National Collection.

*Allotype*—♀, Kaslo, B. C., (Cockle) August 6th, 1921, in the author's collection by the kind permission of the collector.

*Paratypes*—1 ♀, Kaslo, B. C., (Cockle) August 12th, 1909, in the Canadian National Collection. 1 ♀, Mt. McLean, B. C., (A. W. Hanham) August 14th, 1921, in the collection of Mr. Hanham.

Mr. Hanham captured his single specimen at an altitude of 5,500 ft. This new species is very close to *tenuifascia* Sm. but can be distinguished from the latter by its somewhat larger size, its darker ground color, and more contrasted maculation. It is also easily separated by the underside, which in *tenuifascia* is of a uniform warm brown color with a narrow cream band crossing both wings.

**Litholomia napaea umbrifasciata** nov. var.

This new race is probably best described by comparison with typical *napaea*, which is so well known and has such a wide distribution.

In *napaea* the ground colour is dark grey with the maculation somewhat obscured; in *umbrifasciata* the ground colour is greyish white with a narrow dark brown median band standing out in striking contrast to the remainder of wing. This band divides the orbicular and reniform and runs from costa to inner margin. It is sharply defined on the anterior edge but posteriorly it fades into a paler umber-brown shade extending the whole width of the wing. In some specimens this shade extends to and is bordered by the t.p. line, which gives it the appearance of a rather wide band. The dark-filled reniform, in most specimens, stands out in contrast to the pale ground colour, while the orbicular is sometimes hardly discernible owing to its white filling. In *napaea* the reverse is the case. *Umbrifasciata* also seems a little more robust, a trifle wider in breadth of wing, and somewhat larger, averaging 1 to 2 mm. more in alar expanse than *napaea*.

Described from 15 specimens, 6 ♂♂ and 9 ♀♀ all taken by the author at Victoria, B. C.

*Holotype*—♂, Victoria, B. C., March 30th, 1916, in the Canadian National Collection.

*Allotype*—♀, Victoria, B. C., March 21st, 1915, in the author's collection.

*Paratypes*—5 ♂♂, March 24th to April 10th; 8 ♀♀, March 20th to April 16th.

Paratypes will be distributed to the Canadian National Collection; Provincial Museum, Victoria, B. C.; United States National Museum; and the Dr. Wm. Barnes collection.

This is a very distinct geographical race and occurs throughout the southern half of Vancouver Island. I have also seen specimens from Vancouver, New Westminster, and Fraser Mills. These localities are situated in the extreme western end of the Lower Fraser Valley, which has a similar fauna to that of Vancouver Island.

Typical *napaea* also occurs at various points in the interior of British Columbia, specific localities being Lillooet, Vernon, Salmon Arm, Vavenby and Kaslo.

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## *LEPERISINUS CALIFORNICUS* SW. KILLING ASH TREES.

BY R. W. DOANE,

Stanford University, Calif.

For several years we have seen the ash trees (*Fraxinus americanus*) planted on the University campus, suffering from the attacks of a *Leperisinus*. At first it seemed that they might confine their work to the smaller branches, many of which were killed, but during the last two or three years they have been attacking larger branches on many of the trees and they are now often found in the trunk of some of the smaller trees. Practically all of the young trees bordering a road on one part of the campus have been killed in this way, and the older, larger trees, in some parts of the arboretum, are ragged and deformed on account of the loss of so many of the branches.

The primary injury is done by the adult beetle which usually selects some rough place on the bark or at the base of a twig or on a bud as a point of entrance. It then bores into the cambium and begins to bore round the branch or twig, frequently entirely girdling it. The eggs are laid in little niches on each side of the burrow made by the beetle, and the larvae when they issue follow the grain of the wood, working in the cambium and scoring both the bark and the wood. The pupal chambers at the end of the larval burrows are cut rather deeply into the wood.

As we were unable to identify the beetle that was doing this work, specimens were submitted to Dr. J M. Swaine, chief of the Division of Forest Insects of the Canadian Department of Agriculture, who has determined it as *Leperisinus californicus* Sw., described originally from olive trees, in which it was found to be a primary enemy.*

Most of the species of this genus are not considered to be of primary importance. *L. aculeatus* is very abundant in dying ash throughout the East, but it does not, usually at least, attack the normal trees. There can be no doubt, however, but that the species, referred to in this note, attacks the green limbs of the ash trees, and after killing many of them and thus weakening the tree, it will attack and destroy the cambium of the trunk also.

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*—Canadian Entomologist, Vol. 48, June, 1916, p. 190.

# A ROOT WEEVIL (STEPHANOCLEONUS PLUMBEUS LEC.) REARED FROM STRAWBERRY

BY S. MARCOVITCH,

Knoxville, Tenn.

Large legless larvae of the weevil type were found beneath strawberry roots at Knoxville on June 14 and again on July 13. A few of the larvae were noticed to be boring into the crown. Since these same larvae were encountered in the soil several times while digging strawberry plants, they evidently feed on the roots also. The larvae were fairly abundant but did not appear to cause any serious injury. Pupae were found in the soil on July 13, 1921, and on July 25 an adult emerged. On December 14, 1921 as well as in March, 1922, larvae in various stages were present. It is probable, therefore, that the insect passes the winter as larva in the soil.

This specimen was sent to Prof. Blatchley, who identified it is *Stephanocleonus plumbeus* Lec. Knoxville is far out of its known range, for hitherto the species has been recorded from New Hampshire, Connecticut, Colorado and New Mexico. As far as the writer is able to learn, its food plant is unknown. It is, therefore, thought worth while to describe a species reared from an economic plant, such as the strawberry.

## DESCRIPTION OF ADULT

General coloration greyish; body clothed with a fine whitish pubescence which condenses on the dorsum of the thorax to form two oblique curved bands. Elytra with three black denuded spots on each side; spot near tip of elytra very distinct and shining. Eyes shining black.

Body large, elongate. Beak finely punctured, with a rather high curved median carina, which does not reach the tip of the beak; beak a little shorter than thorax, flat, stout, and somewhat dilated at the tip. Dorsum of head bare, comparatively smooth.

Thorax coarsely punctured, quadrate, suddenly narrowed near apex; sides lobed, partially concealing the eyes; anterior half of thorax with a small median carina, posterior half with a depression. Elytra much wider than thorax, with striae coarsely and closely punctate; intervals flat, finely punctate. Tibiae spined at the tips. Claws of tarsi approximate at base. *Measurements*: Length, 10 mm., width, 4 mm.

## LARVA

General coloration whitish; head brownish. Mandibles brownish, darker towards the tip. Maxillary and labial palpi pale yellow. Epicranial and frontal sutures light colored. Eye spot at base of frontal sutures dark. Body hairs brownish.

Body cylindrical and curved toward ventral side. Surface of body wrinkled, with a depressed lateral line visible from the second thoracic to the eighth abdominal segment. Head about as broad as long; antennae very small, one jointed, and situated at base of mandibles. Mandibles unidentate. Legs wanting, but represented by fleshy protuberances, each bearing a cluster of bristles. Body of larva covered with short, sparse hairs. *Measurements*: Length, 9—10 mm., width, 3½—4½ mm.

# THE PLEURAL SCLERITES OF DIPTERA

BY RAYMOND C. SHANNON,

Bureau of Entomology, Washington, D. C.

This communication is primarily an attempt to bring some of the results of Dr. B. P. Young's work "Attachment of the Abdomen to the Thorax in Diptera"[1] into more general use by dipterists. In this publication figures of the pleura and the base of the abdomen of at least one species of nearly all of our North American families of Diptera are given. Such a work offers a very convenient means of making comparative studies of this part of the anatomy throughout the entire order besides bringing out a number of very important characters, apparently of fundamental value, which may be used as primary or supplementary characters in our present scheme of classification of families and genera. The sclerites are practically unused in systematic work on Diptera except to indicate the position of scales, hairs, or bristles. Doubtless the study of other species, aided by Dr. Young's work, will bring out additional characters. The writer, during some recent studies on several families of Diptera has made use of Young's paper to good advantage and wishes to further emphasize some of the differences that exist.

The anepisternum (mesopleura) of the mesothorax is divided in all but some of the more primitive species. In the Nematocera the sternopleura tends to have its upper posterior corner fused with the posterior section of the anepisternum and is continued lobe-like to the base of the wing with the pteropleura lying beside it. (See figure of *Anopheles,* ibid, pl. xii, 10). On the other hand the Cyclorrhapha instead of having its upper posterior corner fused and produced has its upper anterior corner somewhat fused with the anterior section of the anepisternum and is produced lobe-like to the fore coxa, and the pteropleura lies dorsad and somewhat caudad of its upper margin. Young, in his brief summary, brings out what practically amounts to the same thing, i. e., as a general rule the pleural suture extends from the coxa to the wing base in the Nemocera; while in the Brachycera generally, and the Cyclorrhapha, this suture takes an abrupt turn cephalad in its course from the leg to the wing base.

The writer wishes to call attention to the episternum of the prothorax, commonly called propleura. It is quite apparent that this structure is composed of two, more or less, fused sclerites. The suture can be traced fairly well in a number of widely separated families and, moreover, the vestiture on the two parts is usually distinctly different. Frequently the lower part is more or less setose and the upper is nude; or the lower part may bear distinct bristles while the upper is merely pilose. It has been found convenient to consider these as two separate structures in taxonomic work and the terms upper propleura and lower propleura are used; or to follow morphologists, they may be called anepisternum and katepisternum respectively.

Both Young and the writer[2] called attention to a chitinous tongue-like structure extending from the latero-caudal side of the meso-coxa across the membrane of the coxa in the Syrphidae about the same time. Young further noted that this was also characteristic of the other families of Cyclorrhapha

*—Published by permission of Chief of Bureau.
1—Cornell Univ. Agr. Exp. Sta. Memoir, 44, 1921.
2—Bull. Brook, Ent. Soc. XVI, p. 67, 1921.

except *Platypezidae, Pipunculidae* and *Conopidae.* The writer wishes to call attention to its absence in *Pyrgota* (*Ortalidae*). He has long thought that the *Conopinae* and *Pyrgota* had much in common and this adds to his belief that both may be more closely related than is commonly supposed.

Additional characters furnished by the thoracic sclerites will be pointed out in forthcoming papers.

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## AN AMENDED SYNOPSIS OF THE GENUS MYDAEA (DIPTERA, ANTHOMYIIDAE)

BY J. R. MALLOCH,
Washington, D. C.

In the number of the Canadian Entomologist for January, 1921, page 9, I published a synopsis of the genus *Mydaea* Robineau-Desvoidy which does not include all the then described species, and to enable students of the group to identify such forms as are known to occur in North America, I now present the appended key. This key will, I believe, be found applicable to both sexes.

KEY TO SPECIES.

1. Legs largely or entirely black, only the tibiae sometimes brownish ..... 2
   Legs with all the tibiae and at least part of the femora yellowish ..... 5
2. Halteres yellow ..... 3
   Knobs of halteres brown or black ..... 4
3. Eyes densely hairy; basal abdominal sternite bare .... *calvicrura* Coquillett
   Eyes bare; basal abdominal sternite hairy ..... *hirtiventris* Malloch
4. Arista with its longest hairs as long as width of third antennal segment; tibiae brownish; wings not yellow at bases ..... *obscura* Stein
   Arista with its longest hairs not longer than its basal diameter; tibiae black; wings yellow at bases ..... *rugia* Walker
5. Scutellum largely or entirely yellowish, contrasting sharply wtih the dark colour of mesonotum ..... 6
   Scutellum black, concolorous with mesonotum ..... 9
6. Palpi yellow; antennae entirely or almost entirely yellow ..... 7
   Palpi black; antennae entirely or almost entirely black ..... 8
7. Sides of scutellum below level of the bristles entirely bare; third antennal segment brownish apically ..... *flavidipalpis* sp. n.
   Sides of scutellum with a few setulose hairs at bases below the level of the long bristles; third antennal segment yellow ..... *flavicornis* Coquillett
8. Hind femur without bristles on posteroventral surface except at apex, the anteroventral surface with the bristles almost absent on basal half..... ..... *occidentalis* Malloch
   Hind femur with some fine bristles on apical half of posteroventral surface, the anteroventral bristles long and strong to base ..... *pagana* Fabricius
9. Longest hairs on arista not longer than width of third antennal segment, usually shorter; prealar bristle about one-third as long as the one behind it ..... 10
   Longest hairs on arista distinctly longer than width of third antennal segment ..... 11
10. Longest hairs on arista about as long as width of third antennal segment; hind femur in both sexes usually with two or three bristles at middle

on posteroventral surface; second antennal segment yellowish; fore femur in both sexes yellow ..... *brevipilosa* Malloch

Longest hairs on arista distinctly shorter than width of third antennal segment; hind femur in both sexes usually with some bristles on basal half on posteroventral surface; second antennal segment black; fore femur in male darkened ..... *persimilis* Malloch

11. All femora largely fuscous; prealar bristle, minute; wings not yellow at bases ..... *obscura* Stein

At most the fore and mid femora infuscated basally ..... 12

12. Small species, 5.5 to 6.5 mm. in length; thorax and abdomen with distinct but not very dense pruinescence, the former distinctly vittate only in front; prealar bristle minute ..... *winnemana* Malloch

Larger species, 7 to 9 mm. in length; thorax and abdomen with dense yellowish pruinescence, the former with very distinct vittae ..... 13

13. Fore femora yellow in both sexes; apical segment of fore tarsus in male slightly, in female very much broadened; prealar bristle one-third as long as the one behind it ..... *discimana* Malloch

Fore femora in males infuscated basally at least; apical segment of fore tarsus normal in both sexes ..... 14

14. Prealar bristle over half as long as the one behind it ..... *urbana* Meigen

Prealar bristle not over one-third as long as the one behind it ..... *neglectus* Malloch

### **Mydaea flavidipalpis** sp. n.

*Male* and *female*.—Similar to *flavicornis* Coquillett, the antennae, palpi, and legs including tarsi yellow. Differs in having the fore coxae yellow, not brown or fuscous, the yellow colour on humeral and posterior angles of mesonotum more diffused, the fore tibia in female with a median posterior bristle, the pruinescence of abdomen more yellowish, and as stated in key

Length, 7—8 mm.

Type, male, allotype, and three female paratypes, Glen Echo, Md., June 11—August 8, 1921-22 (J. R. Malloch); one male, Plummer's Island, Md. May 23, 1907 (A. K. Fisher).

### **Mydaea discimana** Malloch

Dr. J. M. Aldrich has shown me a female of this species from continental Europe.

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## AN UNDESCRIBED ANTHOMYID IN THE CANADIAN NATIONAL COLLECTION (DIPTERA)*

BY H. L. SEAMANS,

Lethbridge, Alta.

### **Pegomyia polygoni** new species

*Male*. Black shining with dense gray pruinescence on the thorax and abdomen. Head reddish with bright silvery pruinescence on the orbits, parafacials, cheeks and whole face except the inner slopes of facial ridges and

*—Contribution from the Division of Field Crop and Garden Insects, Entomological Branch, Dept. of Agric., Ottawa.

upper half of antennal fovae in most lights. Eyes separated by less than the width of the anterior ocellus. The second joint of the antennae reddish, the third twice the length of the second, black, flattened, with a black, very shortly pubescent arista. Vibrissa separated by more than twice the distance between either and the eye margin. Palpi deep black, extreme base yellowish.

Thorax distinctly vittate; presutural acrosticals indistinct; prealar bristle less than half the length of the one succeeding. Wings clear, veins at the base bright yellow, darker only near the tips. Calypteres equal, yellow; halteres yellow. All coxae infuscated; femora and tibiae yellow; tarsi black. Abdomen depressed, flattened, the middle line slightly raised, with an indistinct dorsocentral vitta, and dark markings at the segmental borders, from posterior view. Hypopygium not prominent, basal segment reddish, fifth sternite gray, no remarkable bristling, and only a few bristly hairs on the basal segment.

Fore femora with a row of hair-like bristles on both the anterodorsal and anteroventral surfaces; fore tibiae with one posteroventral bristle near the middle, and with one dorsal bristle at the apical third. Mid femora with a row of four or five small bristles on the apical fourth of the posteroventral surface, and two short, postero-apical bristles; mid tibiae with three or four posterior and one postero-dorsal bristle. Hind femora with a row of seven or eight antero-ventral bristles and an irregular row of antero-dorsal bristle-like hairs; two dorsal preapical bristles, a preapical posterior bristle and a row of three or four closely placed, short postero-ventral bristles close to the apex; hind tibiae with two short antero-ventral, two strong antero-dorsal and three postero-dorsal bristles. Length 5-6 mm.

*Female.* Differs from the male in its smaller size, general yellowish gray color, especially marked on the scutellum and abdomen, rather thickly greyish yellow pruinose, the pollen shining.

Head generally more yellowish than red, with dense silvery pruinescence as in the male. Lower supra orbital bristles directed backward, upper orbitals directed forward and divergent. No thoracic or abdominal markings, but mesonotum and pectus diffusely somewhat darker. Bristling of the legs much the same as in the male except that there are four antero-dorsal and two postero-dorsal bristles, with an additional antero-dorsal and postero-dorsal apical bristle, much smaller than the others. Length, 4.5—5 mm.

*Holotype*— ♂, Aweme, Man., May 25, 1921, (N. Criddle); bred from *Polygonum convolvulus* L.; No. 592, in the Canadian National Collection, Ottawa.

*Allotype*— ♀, same data, May 24.

*Paratypes*—2 ♂, same data, May 24, and 25, the latter headless.

This species was reared by Mr. N. Criddle of the Entomological Branch, at Aweme, Manitoba. The larvae were found mining in the leaves of *Polygonum convolvulus* L. during September. Mr. Criddle states that the mines were a blotch mine forming a rather large blister. The larvae pupate in the fall and the adults emerge the following May. It is probable that there is more than one brood during the year.

This species runs to *unguiculata* Mall. in Malloch's key to the genus *Pegomyia* as published in the "Bull. Brook. Ent. Soc.," Vol. XV, p. 121, but is readily distinguished from that species.

## ANNUAL MEETING OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO.

The sixtieth anniversary of the founding of the Entomological Society of Ontario will be celebrated by a series of meetings to be held in Ottawa on Thursday, Friday and Saturday, November 1st, 2nd and 3rd, 1923.

It is to be hoped that all members and friends of the Society will make a special effort to attend and participate in the programme. Titles of papers should be in the hands of the local secretary not later than Monday, October 22nd.

Reservations may be obtained at the Chateau Laurier, Russell, Alexandria and Windsor Hotels. Members are advised to make their reservations early.

FRANK MORRIS, PRESIDENT,
A. W. BAKER, SECRETARY.

LEONARD S. McLAINE,
LOCAL SECRETARY,
ENTOMOLOGICAL BRANCH,
DEPT. OF AGRICULTURE, OTTAWA.

Date of mailing, September 29th.

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